

Equatorial Sundial Construction

by J. Vondruska

Materials

1 - pine wood, 7 1/4 x 5" long
1 - pine wood, 7 1/4 x 8" long
1 - 1/4" dowel, 10" long
1 - door hinge

1 - right angle bracket with screws
Drill, 1/4" drill bit,
Screw driver
Ruler

Construction

NOTE: In the figures associated with steps 1 - 5, the lines are shown in marker. It is recommended you draw them first in pencil and once checked by your instructor, trace over them in colored marker.

1. On the smaller piece of pine board, draw a straight line with a pencil approximately 1.5 cm from the long edge. Measure and mark the center of this line. (See Figure 1)
2. Flip the board over the repeat Step #1. Make sure the lines are drawn on the same edge on each side.
3. Place a protractor so it is centered on the line. With a pencil, trace around the edge of the protractor and mark every 15° from the line (see Figure 2). Repeat the process on the other side of the board.
4. Draw lines from the center of your long line to the edge of the protractor through each 15° marking. (See Figure 3)

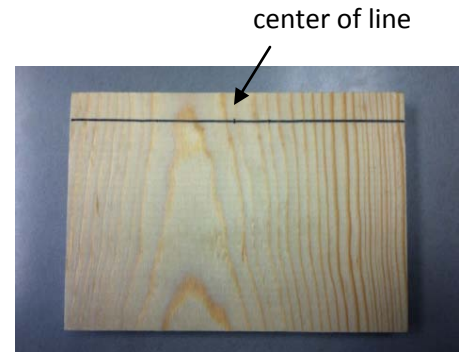


Figure 1



Figure 2

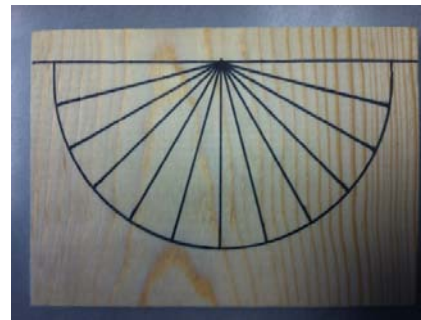


Figure 3

5. Mark each line with the appropriate time (6 am to 6 pm) as indicated in Figure 4. Repeat Steps #4 & 5 on the other side of the board. Make sure the am and pm sections are exactly opposite each other on the board (see Figure 5).

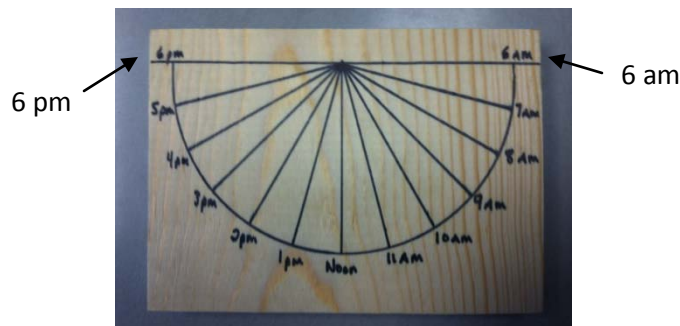


Figure 4 - front view

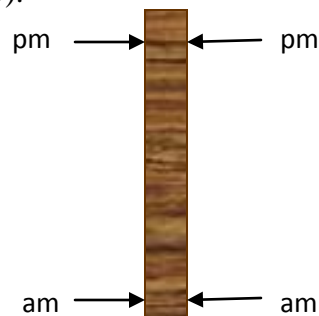


Figure 5 - top view

6. Have your instructor check your work before proceeding.
7. Once your markings have been approved, retrace them with a colored marker.
8. Drill a hole through the center of your long line. Dry fit your dowel through the hole. It should be a snug fit. Remove the dowel. (Note: drilled hole can be seen in Figure 6)
9. Place the larger and smaller board next to each other with their long edges nearly touching. For the shorter board, have the side away from the long line next to the larger board (see Figure 6).
IMPORTANT - note the orientation of the am/pm sides in Figure 6 so you don't attach the board backwards.
10. Place the door hinge between the two boards approximately in the center. Make sure the hinge is correctly oriented so the small board could fold flat onto the larger board.
11. Screw in the door hinge (Figure 6).
12. The angle of your sundial should be the same as your co-latitude ($90^\circ - \text{latitude}$). For example, if you live at a latitude of 46° N , your sundial angle should be 44° .
13. Insert your dowel into the hole and adjust it until the angle of the sundial equals your co-latitude. (Note: It is not necessarily easy to measure this angle. One method is shown in the Figure 7.)
14. Mark the edge of the dowel on the large board, once the angle is correct.
15. Open your sundial and position the right-angle bracket at the dowel mark and screw it into position. Now reposition the sundial so the dowel rests against the right-angle bracket and is at the appropriate angle.

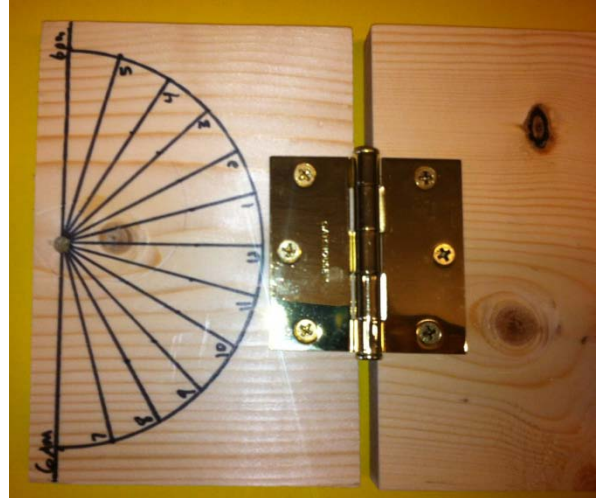


Figure 6

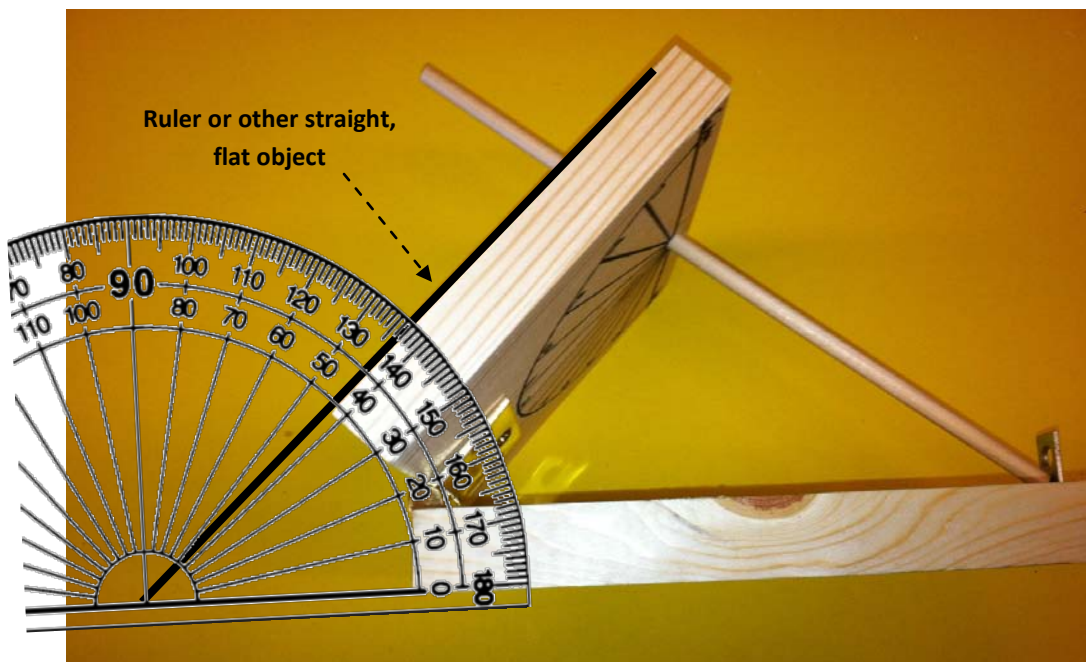


Figure 7